IN THE FIELD

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Fall 2021

Field Museum
Member Magazine

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ON THE COVER
A brightly colored panther chameleon from Madagascar.
CREATIVE COMMONS

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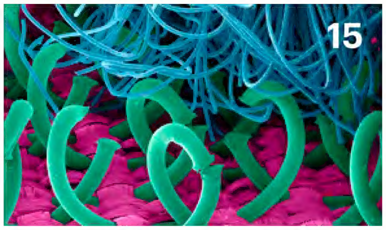

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Dear Friends,

I arrived at the Field Museum just over a year ago. It has been a delight getting to know the people who make this place exceptional, especially our donors and members.

You share our deep appreciation for the magnificent collections, research, and exhibitions contained within our famous, 100-year-old building. While many events and celebrations of the Museum's centennial have been postponed due to the continuing COVID-19 pandemic, we look forward to celebrating with you the rest of this year.

Last month, we removed a time capsule from the north stairs. Originally placed in 1921 at the opening of the Field, the capsule had been opened just once, in 1974, for the 80th anniversary of the institution's founding. I look forward to sharing the contents of the time capsule in the months to come, and—more importantly—I hope you will help us consider what should be placed as our message to the members of the Field Museum community when the capsule is opened again in the distant future.

Our Building Centennial celebration will continue until May 2022, and we look forward to celebrating with you. Look for more information about *Celebrating 100 Years in our Lakefront Home* in the months to come.

While the challenges of the pandemic continue, we have protocols in place to ensure a safe and enjoyable visit for all. I look forward to seeing you in the galleries this winter, especially in our two newest exhibitions, *Biomechanics: The Machine Inside* (p. 15) and *Wild Color* (p. 6).

Warm regards,

Julian Siggers

Julian Siggers, PhD

President and CEO

Help us Celebrate 100 years of our Lakefront Home!

2021 marks the 100th anniversary of the opening of the Field Museum's iconic lakefront home. For a century, this grand structure has captured the imagination of nearly 137 million visitors, supported the research of generations of scientists, and housed an irreplaceable collection of artifacts and specimens that has today grown to 40 million!

The generous support of members and donors—like you—sustains this excellence. Celebrate our building's birthday and help us ensure the Field's next 100 years with a special gift!

Join the Founders' Council with a gift of $2,500

Members of this premier annual giving community enjoy behind-the-scenes access to our collections and the scientists who study them. You will also receive invitations for exclusive online and in-museum events.

Join the Discovery Circle with a gift of $250

Receive a one-year museum membership and an invitation to an exclusive virtual program.

Adopt a Specimen

The Field Museum holds more than 20 million zoological specimens, of which 2 million have been digitally catalogued. In honor of our building's centennial, we are proud to offer an opportunity to adopt one or more specimens in our collections—either for yourself or as a gift for the natural history enthusiast in your life.

WIND BENEATH OUR WINGS

Adopt a bird

$1,500

SCALE YOUR SUPPORT

Adopt a fish

$1,000

FLUTTERY PHILANTHROPY

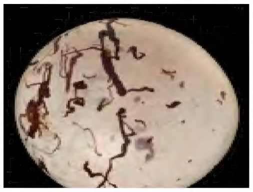
Adopt a butterfly

$500

REP(TILE) THE FIELD MUSEUM

Adopt a Snake

$250



BUILDING A NEST EGG

Adopt a Bird's Egg

$150

BEETLE-MANIA

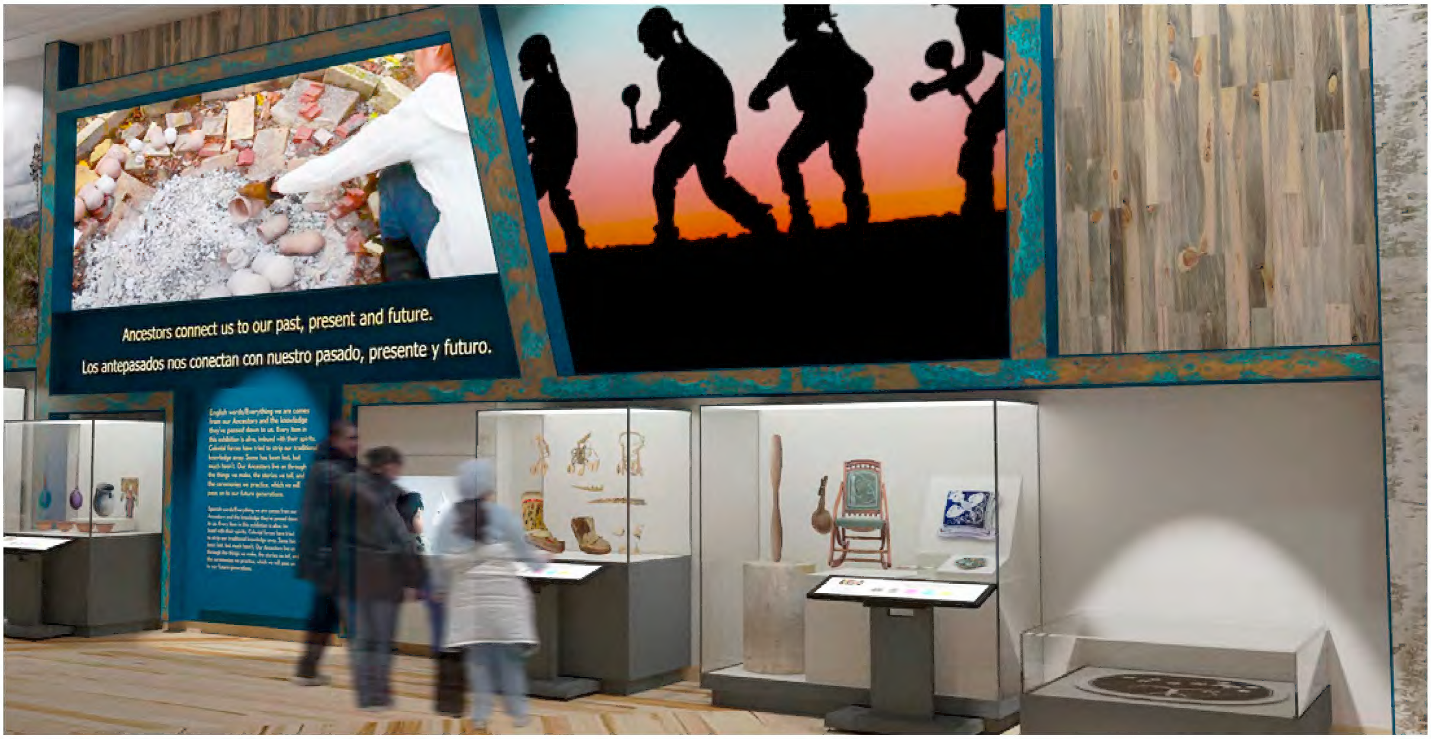
Adopt a Beetle

$100

Adopters receive:

+ Digital recognition for one year in the Field's publicly searchable collections records
+ Personalized digital certificate of Centennial Adoption with unique specimen details and official collections identification number
+ Invitation to a lecture by a Field Museum expert
+ Commemorative Centennial souvenir

Make your gift or adopt a centennial treasure today: visit fieldmuseum.org/centennial or call 312.665.7777.


Ancestors connect us to our past, present and future.
Los antepasados nos conectan con nuestro pasado, presente y futuro.

Exclusive First Look:

NATIVE NORTH AMERICA HALL

BY ALAKA WALI, PHD, CURATOR OF NORTH AMERICAN ANTHROPOLOGY, NEGAUNEE INTEGRATIVE RESEARCH CENTER, AND **TOM SKWERSKI,** EXHIBITIONS

The Field Museum is entering the final year of its renovation of the Native North America Hall. This redevelopment is being done in collaboration with Native American scholars, museum professionals, community leaders, and artists. We are looking forward to sharing a ground-breaking exhibition in which partners from more than 100 Tribes and nations tell their stories of self-determination and resilience, of continuity and change. More than 200 items from the Field Museum's collection and contemporary works created especially for the exhibition will showcase the relationships between past, present, and future and speak to the vibrancy of Native American cultures and lifeways.

At the core of the exhibition are four dynamic galleries featuring regional stories and perspectives. The four opening stories will be: Lakota flutes and contemporary music from the perspective of a young hip hop artist; the continuing legacies of famed California basketry making; the revitalization of Meskwaki agriculture and food sovereignty in Tama, Iowa; and the relationship of the Chaco Canyon sacred sites to the Pueblos and Hopi in the Southwest. An anonymous donor has provided an endowment in honor of Richard and Jan Larviere to support maintenance of the exhibition and installation of new stories on a regular basis.

Additionally, the new hall will feature a gallery devoted to Chicago, making visible the underrepresented urban Native American community. Working with our Chicago Native Advisory Group, the gallery will highlight the idea that Chicago has always been a Native place where many regional Tribes gathered, exchanged knowledge and goods, and shaped the landscape. The opening display will feature historic and contemporary photographs with selected items to highlight stories important to the community. The iconic Pawnee Earth Lodge will remain a part of the new hall, and will feature updated interpretation that incorporates Pawnee perspectives on their values and belief systems and present-day way of life.

A section called "We Speak for Ourselves" will showcase diverse Native voices and a mixture of contemporary art, video, and poetry. Over 50 new works are being commissioned from nationally renowned artists for the exhibition and reflect the diverse range of contemporary Native American art.

The new exhibition, opening spring 2022, will present Native American perspectives on social life, cultural practices, historical events, and the power of cultural items in an immersive experience. It will provoke visitors to learn more about the centrality of Native Americans to the American story and the on-going processes of resilience, cultural revitalization and knowledge making that characterize Native communities today.

(Top) Design rendering of the first section of the hall.

(Above) Flower-patterned basket made by a Cahuilla Ancestor ca. 1904, (Catalog Number 84889).

USING SCIENCE TO SAVE THE SHARKS

BY KEVIN FELDHEIM, PHD, A. WATSON ARMOUR III MANAGER OF THE PRITZKER LABORATORY, NEGAUNEE INTEGRATIVE RESEARCH CENTER

Over the past several decades, sharks have become imperiled by overfishing, pollution, and global warming. Several important conservation plans have been implemented for many species globally, including limits on fishing and designating marine protected areas. One management strategy that hasn't had much attention is captive breeding. For sharks, captive breeding is in its infancy, especially compared to other vertebrates. Recently, some aquarist colleagues asked if I would be interested in helping with experimentation with artificial insemination (AI) in whitespotted bamboo sharks. This species is common in aquariums, is relatively small (2-3 feet), and reproduces readily in human care. As such, it was a perfect species with which to explore the possibility of AI.

My colleagues extracted sperm from male sharks and either used that sperm to inseminate a female at the same aquarium, or transported it to a different aquarium (sometimes across the country) to see if the sperm remained viable 24 hours after extraction. We found that fertilization success did not decline with sperm stored up to 24 hours after extraction.

My part in the project was to perform paternity analysis. Basically, it was my job to determine whether a particular pup was in fact sired by the male they extracted the sperm from. With only two exceptions, the baby sharks were a genetic match to their supposed fathers. The exceptions were two cases of parthenogenesis, or virgin birth, something we have seen previously in this species. This phenomenon occurs in several shark species, mostly in an aquarium setting when a female has been isolated from males. In this study, one female gave birth to a pup via parthenogenesis four days after being artificially inseminated. This pup was likely developing before any of the female's eggs were fertilized. The second female gave birth to two pups by parthenogenesis 80 and 83 days after giving birth via sexual reproduction.

Historically, to mate individuals between institutions, animals had to be physically moved. This was not only costly but also stressful for the animal. Instead, transporting sperm between aquariums will allow us to maximize genetic diversity in the captive population. It will also allow for aquarists to mate animals internationally, allowing the entire global population to contribute to the gene pool.

The next step for this project is to try AI on species that are endangered or on the brink of extinction. The hope is this technique can be used to bolster the captive population of these species with the ultimate goal of reintroducing individuals into the wild.

Several institutions were involved in this project: the South-East Zoo Alliance for Reproduction & Conservation in collaboration with, the Aquarium of the Pacific (Long Beach, California); Ripley's Aquarium of the Smokies (Gatlinburg, Tennessee); The Florida Aquarium (Tampa, Florida); and Adventure Aquarium (Camden, New Jersey).

CALLIE BOATRIGHT, AQUARIST RIPLEY'S AQUARIUMS

(Above) Whitespotted Bamboo shark, Chiloscyllium plagiosum, egg or also called a mermaid's purse is backlit (light held behind the egg so one can see the contents within).

(Below) Whitespotted Bamboo shark located in Ripley's aquarium of the Smokies, Raybay exhibit.

SHANNON KRIEG, AQUARIST, RIPLEY'S AQUARIUMS

JOSEPH CHIKUMBIRIKE, PHD (2019)

ABIGAIL MOFFETT, PHD (2012)

MEET OUR NEW ASSISTANT CURATOR OF AFRICAN ANTHROPOLOGY: FOREMAN BANDAMA

BY KATE GOLEMBIESKI, PUBLIC RELATIONS

Dr. Foreman Bandama began studying archaeology by chance. When he went to sign up for classes as an undergraduate at the University of Zimbabwe, there happened to be spots available in archaeology. "Once I started, I fell in love with it—just pure discovery of the past, learning where we came from, and how important it is to care for that past," he said. Before coming to Chicago, he received his PhD from the University of Cape Town, where he also worked as a postdoctoral researcher prior to taking up a teaching position at Sol Plaatje University (Kimberley South Africa).

In his research, Bandama has done everything from excavating pottery to conducting detailed chemical analyses of glass beads, but he says all his work has been driven by a unifying goal: highlighting African achievements.

"We all come from Africa, and some writings seem to suggest that once *Homo erectus* left the continent, all the bright minds left," said Bandama. "The colonial education we received made us think that every cool thing started with colonial contact." Bandama's work helps to deconstruct those ideas by exploring the ingenuity of people from many cultures throughout the African continent.

"There are beautiful stone walls, with no mortar used to bind them, that are so tall that when you stand on top of them, the people below look like ants," he said. "And in metalworking, melting iron from rock requires precise skills. It's amazing."

In his new position at the Field and his teaching position at the University of Illinois at Chicago, Bandama says he looks forward to connecting people with the museum's collections and giving those collections a voice. "I want to help dispel misconceptions about Africa," he said. "And I want to welcome diverse audiences to come enjoy Africa's heritage."

> "Once I started, I fell in love with it—just pure discovery of the past, learning where we came from, and how important it is to care for that past."

(Above) Assistant Curator Foreman Bandama holding a decorated ceramic sherd from the excavation trench at the site of Shankare in Northeastern South Africa.

IMMERSE YOURSELF IN

WILD COLOR

By Janet Hong

EXHIBITIONS

The Field Museum's newest exhibition, *Wild Color*, will sharpen visitors' perceptions and amplify their enjoyment of nature's wonderful colors.

(Opposite, far left) A brilliant orange clown fish swims through a sea anemone.

(Opposite, left) A rainbow array of tanagers from the Field Museum's collection.

(Below) Take a photo of your friends and family with large butterfly wings fluttering behind them in the yellow room!

YELLOW
Ne voluptas essus essinimus ut velestia dignisq uibeatiam qui sintor rempore perchic idunt. Am fugiatia inti autatiorum fugitia voluptae omnimin.
AMARILLO
Gentem nonsentur re odionsequi tet eiusand esciusanimus quam, si nost, odis pro quam ipsus eum expersperci comnimi, quunt ad quatempore, num inus niendae necuptatiis ditaquas sequatur am.

Be transported out of the everyday world and into the color-drenched spaces of *Wild Color*. Walk through the rainbow, soak up intense colors, and delve into the surprising stories that lie just beneath the surface of nature's hues.

Throughout the world's ecosystems, plants, animals, and other organisms, color is used to signal, warn, confuse, protect from the sun, and more! And, while minerals and gems don't use color like organisms do, they produce some of the most splendid and concentrated colors in nature. Come experience some of the finest objects from the Field's collections on a trip through the rainbow.

Discover that sometimes animals live up to the adage "you are what you eat", and turn bright hues from their food. Cardinals in our backyards (*Cardinalis cardinalis*) and the polyps of organ pipe coral in the Indian Ocean (*Tubipora musica*) both turn red from eating foods containing carotenoids. Some critters and plants use light-reflecting nanostructures on their surfaces to appear blue, but don't contain any blue pigments at all. Morpho butterflies (*Morpho menelaus*) and mandrills (*Mandrillus sphinx*) use this technique to flash some of the most startling blues among fauna. And based on recent research conducted at the Field, visitors to *Wild Color* will be treated to a beautiful (but perplexing!) view of a platypus turning bright fluorescent hues under ultraviolet light.

These experiences and more will launch visitors out into the world with a sharpened perception and an amplified enjoyment of nature's wonderful colors.

***Wild Color* is now open in the Marshall and Doris Holleb Hall. Admission is free for members.**

Wild Color was created by the Field Museum.

Major Sponsor:

ADM

A desert spotted skunk (Spilogale leucoparia) observed on a ranch in West Texas.

ROBERT C. DOWLER

SCIENTISTS DOUBLE THE SPECIES OF SPOTTED SKUNKS

BY KATE GOLEMBIEWSKI, PUBLIC RELATIONS

Picture a skunk. You're probably thinking of a stocky, black and white striped animal that's around the size of a housecat. This describes North America's most common skunk—the striped skunk—but they also have smaller, spotted cousins. Scientists still have a lot to learn about spotted skunks, starting with how many kinds of them exist. Since they were first discovered in 1758, the number of recognized species has ranged from two to fourteen. Most scientists today agree there are four. But, in a new paper in *Molecular Phylogenetics and Evolution*, researchers—including Field Museum Research Associate and Chicago State University (CSU) Assistant Professor Dr. Molly McDonough, PhD, and Negaunee Mammals Collections Manager Adam Ferguson, PhD—analyzed skunk DNA and found that there aren't four species of spotted skunk; there are seven.

Even though North American carnivores are by and large well-known, skunks are often understudied, in part because catching skunks is a good way to get sprayed. On top of that, spotted skunks are good at climbing trees and are usually found in remote areas. To acquire the specimens needed for the study, the researchers had to get creative.

> **...there aren't four species of spotted skunk; there are seven.**

"We distributed 'Wanted Posters' across Texas in case people trapped them or found them as roadkill," said Ferguson, who began collecting specimens used in this project while working on his Master's degree at Angelo State University.

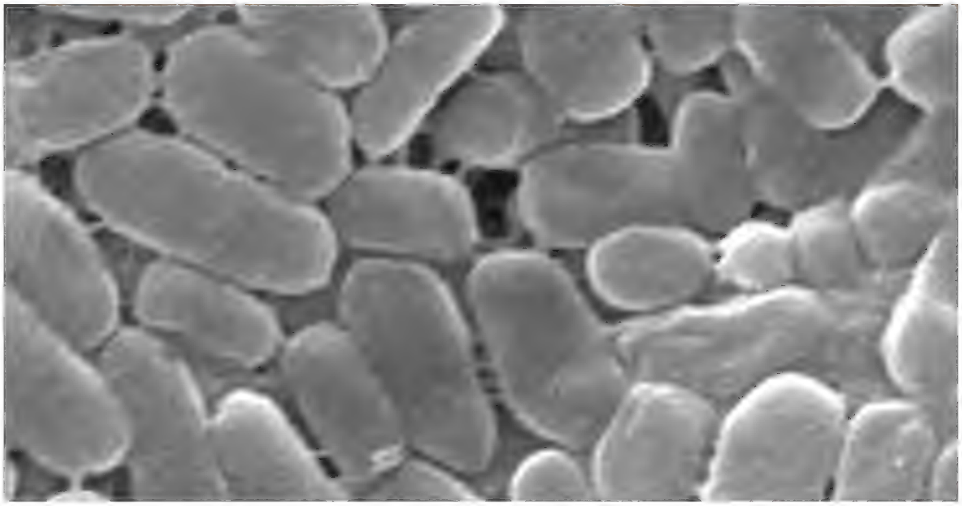
In addition to modern specimens, the scientists used skunks in museum collections. "If we're trying to tell the full story of skunk evolution, we need as many samples as we can get," said Ferguson. "For example, we didn't have any modern tissues from Central America or the Yucatan. But, we were able to use museum collections to fill the gaps."

The researchers took tissue samples from the skunks and analyzed their DNA. Comparing the DNA sequences revealed that some of the skunks that had previously been considered the same species were substantially different. These genetic differences led the researchers to regroup some of the skunks and resurrect several species names that haven't been used in centuries.

Among the animals described as a new species is the Plains Spotted Skunk, previously considered a subspecies, which has been in decline for the past century. Conservationists had previously petitioned for them to be listed as an endangered subspecies. "If a subspecies is in trouble, there's sometimes less emphasis on protecting it because it's not as distinct an evolutionary lineage as a species," said Ferguson. "But, we've shown that the Plains Spotted Skunks are distinct at the species level, which means they have evolved independently of the other skunks for a long time. Once something has a species name, it's easier to conserve and protect."

THE KEY TO UNDERSTANDING ENVIRONMENTAL DECAY: MICROBES?

BY NOÉ DE LA SANCHA, PHD,
RESEARCH ASSOCIATE, NEGAUNEE INTEGRATIVE RESEARCH CENTER



Our planet is undergoing dramatic, human-driven environmental changes—including habitat fragmentation and loss, climate change, biodiversity loss, urbanization, and threats to food security. These kinds of changes increase stress on Earth's complex biological systems, and are dangerous for our future. In a recent paper published in *Integrative & Comparative Biology*, my colleagues—who include animal and plant ecologists and microbiologists—and I argue that the current environmental changes stressing Earth's biological systems require analysis from an integrated perspective.

This means that researchers studying climate change, large scale biodiversity loss, and landscape changes should look at all the different parts of an ecosystem to reveal unexpected interactions, particularly between microbes (ie., viruses, bacteria, and parasites) and macroscale phenomena (ie., large scale deforestation and climate change). By studying these kinds of interactions closely, scientists can deepen our understanding of the connections between deforestation and emerging infectious disease, ecosystem disturbance and the gut microbiome, and the cross-scale effects of environmental pollutants.

Specifically, in this paper, we focused on microbial phenomena as potential drivers or mediators of macroscale phenomena. We provided three concrete examples:

1) interactions between the gut microbiome and the host's external environment;

2) the large-scale distribution of plants and their connection to soil microbial communities, and

3) the links between infectious diseases and environmental disturbance.

The study grew out of a 2019 National Science Foundation workshop, Reintegrating Biology Jumpstart, that brought together microbiologists and ecologists to outline ways to study links between microbes and global level phenomena.

"Microorganisms are an elusive component of biological diversity, and yet they are the most abundant of all life forms. Understanding how microbes respond to environmental change can help us prevent epidemics, improve food security and nutrition, and better plan the use of our natural resources," said Carlos Zambrana-Torrelio (EcoHealth Alliance). Our paper also emphasizes the importance of biorepositories—like natural history museums—to this kind of research and the importance of funding for field-based research, including the collection of voucher specimens, or an object reference documenting the identity of a discovered species. Such specimens are important to understanding the complex questions of the biodiversity crisis, biomedical research, the effects of climate change, zoonotic hotspots, and conservation management.

(Top) Chicago State University student Gabriel Hernandez studies museum specimens housed at the Field Museum. These specimens are criticality important for understanding biodiversity at multiple spatial and temporal scales, and for accurate associations with microbes, zoonosis, and response to environmental changes.

(Above) Salmonella typhimurium *DT104 under a microscope.*

NOÉ DE LA SANCHA
DR. EBONY WEEMS, BIOLOGICAL AND ENVIRONMENTAL SCIENCES, AND DR. JOSH HERRING, DEPARTMENT OF FOOD AND ANIMAL SCIENCE, AAMU

Women and Careers in Paleontology

Adrienne Stroup

Geology Collections Assistant

I have always been interested in nature, natural history, and deep time. I am one of those people who grew up loving dinosaurs and never grew out of that phase. Between my Bachelor's degree in geology and my Master's in museum studies and cultural heritage preservation, I spent six years working in archeology as a field technician.

Science and paleontology are historically male-dominated. It can seem frustrating and daunting to make a name for oneself in these fields as a woman, but don't give up!

Finding a mentor at school—or even in an online community—can make a huge difference. There are some great Facebook groups for women and people of diverse genders that are very welcoming and inspiring.

Az Klymiuk, PhD

Paleobotany Collections Manager

I grew up in Treaty 8 Territory in northern Alberta, Canada, where my family practiced a subsistence-dominated lifeway connected to the land. My PhD studies took me to the University of Kansas in Lawrence, where I switched my focus from conifers to fungi, describing fungal microfossils from the Eocene (56–33.9 million years ago). This is how I became interested in understanding how plant-microbe interactions may differ in wetlands compared to fully terrestrial settings.

The advice that I find myself giving most often these days is this: imposter syndrome is very rarely a real thing. It is a toxic way of personalizing a systemic problem. You feel like you don't belong because you lack role models, you lack representation, you lack equitable pay, et cetera. The problem isn't that you have imposter syndrome. The problem is that academia and science are still not equitable spaces.

So my advice is this: be aware of the system. Don't personalize systemic issues, diagnose them. Just being present in these spaces is activism.

Have you ever wanted to work with dinosaurs and other fossils? **Adrienne Stroup, Az Klymiuk, Adrienne Stroup, Pia Viglietti, and Akiko Shinya** collectively hold ten degrees in disciplines including geology, ecology and evolutionary biology, and museum studies and cultural heritage preservation.

Their investigations range from plant-microbe interactions in prehistoric wetlands to the evolution of land ecosystems. **Here's what they have to say about their field!**

CORY DINTER

Pia Viglietti, PhD

Postdoctoral Fellow with the Grainger Bioinformatics Center

I got into the field of paleontology through studying geology. I grew up in Cape Town, South Africa and, at the University of Cape Town, I was introduced to the rich fossil record of South Africa's Karoo Basin that spans over 100 million years of Earth history. After completing my Bachelor of Science degree, I knew I wanted to pursue a career in research dedicated to understanding this fossil record.

For women and people of diverse genders who want to get into science, I would start by following the growing number of scientists on social media platforms like Twitter. Many are speaking out about social issues in science and creating a support network for those interested in entering a science field.

They have shown me the importance of finding support in networking and hearing the lived experiences of a diverse group of people in science. Then, once you know what you'd like to work on and where, don't be afraid to ask prospective workplaces or advisors difficult questions. Talking to previous students or staff about an institution or advisor is another way to find out whether the workplace or lab's culture is the right fit for you.

Akiko Shinya

Chief Fossil Preparator

I was born and raised in Japan. After a long roundabout way, I ended up at the University of Toronto and completed my Bachelor of Science in geology, specializing in vertebrate paleontology. My experience as a fossil preparator began as a volunteer in the Paleobiology Department at the Royal Ontario Museum. There, I received essential training to become a fossil preparator both in the lab and in the field.

I'm inspired by the sense of discovery I get when finding and preparing fossils. The most fascinating part of paleontology is in uncovering evolutionary secrets. I have been very fortunate to work with people and mentors who have no bias towards me as a woman or an Asian. I also think that I was lucky to find a good match with my interests and my skills. I love paleontology, but I'm not good at writing papers. However, I am great at preparing, finding, and excavating fossils, so it is a perfect match for me to be a fossil preparator and contribute to science.

Perhaps it will be helpful for you to find what sparks your interests, target your skills, and find a good mentor.

EARTH'S LARGEST EXTINCTION EVENT TOOK LONGER ON LAND

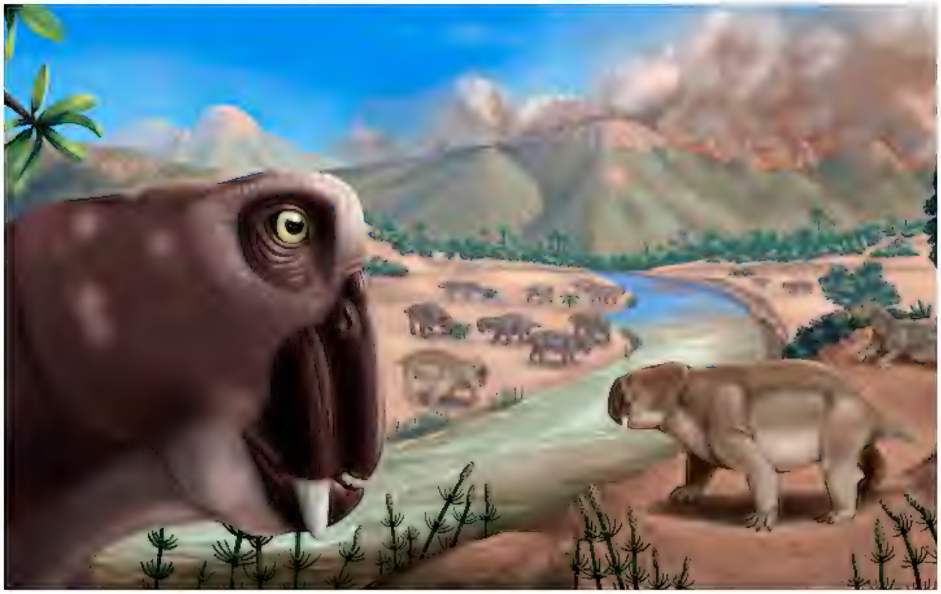
BY PIA VIGLIETTI, PHD, POSTDOCTORAL RESEARCH SCIENTIST, NEGAUNEE INTEGRATIVE RESEARCH CENTER, AND **KATE GOLEMBIEWSKI**, PUBLIC RELATIONS

As concern for the looming climate crisis grows, the fossil record can give us some idea of what biodiversity crises are like and how they proceed. Each of the "Big Five" mass extinction events that occurred in the past 500 million years–with the exception of the asteroid impact that caused the extinction of the dinosaurs–were triggered by changes to global climate. Our planet's worst mass extinction event happened 252 million years ago when massive volcanic eruptions caused catastrophic climate change. The vast majority of animal species went extinct, and when the dust settled, the planet entered the early days of the Age of Dinosaurs. This extinction may give us the best idea of what to expect from our current crisis. But scientists are still trying to understand the timing of the event in the oceans versus on land, and about the patterns of which animals went extinct and which survived.

My new research—along with Field Museum Curator Ken Angielczyk, PhD, and collaborators at Oxford University, North Carolina Natural History Museum, Iziko South African Museum, and the National Museum (Bloemfontein)—reveals that extinction looked very different on land than in the oceans, and that it takes a long time for earth to recover from mass extinctions.

Scientists know more about what happened during this extinction in the oceans because there is a more complete fossil record of life underwater. As a result, paleontologists know that 85% of species living in the oceans went extinct within 100,000 years. Of the entire 3.9 billion years that life has existed, that's equivalent to 14 minutes of a full year. And, while 100,000 years seems like a long time to us, it's very quick in geologic time.

MICHAEL DAY



ARTWORK BY GINA VIGLIETTI

To learn what happened to life on land, Ken Angielczyk, our collaborators, and I examined 588 fossils of land animals that lived before, during, and after this extinction event. We created a database and separated fossils by age, dividing them into groups by 300-thousand-year time intervals. This allowed the extraction of the all-important signal of extinction from the data. One species that helped reveal extinction and recovery patterns was *Lystrosaurus*, a herbivorous early mammal relative with a peculiar combination of a turtle-like beak and tusks. *Lystrosaurus* is what palaeontologists call a "disaster taxon," a species that flourishes in the aftermath of extinction. However, the team found that *Lystrosaurus* was already abundant before the extinction even began. Examining fossils like *Lystrosaurus* showed the end-Permian Extinction was a much longer and drawn out affair on land.

(Top) Pia Viglietti collecting a fossil in South Africa's Karoo Basin. Fossils such as these were included in the study to better understand the end-Permian Extinction on land.

(Above) A reconstruction of the tusked mammal relative Lystrosaurus, a disaster taxon that lived during the end-Permian mass extinction event over 252 Million years ago.

The Cyrus Tang Hall of China is made possible with the generous support of the Cyrus Chung Ying Tang Foundation.

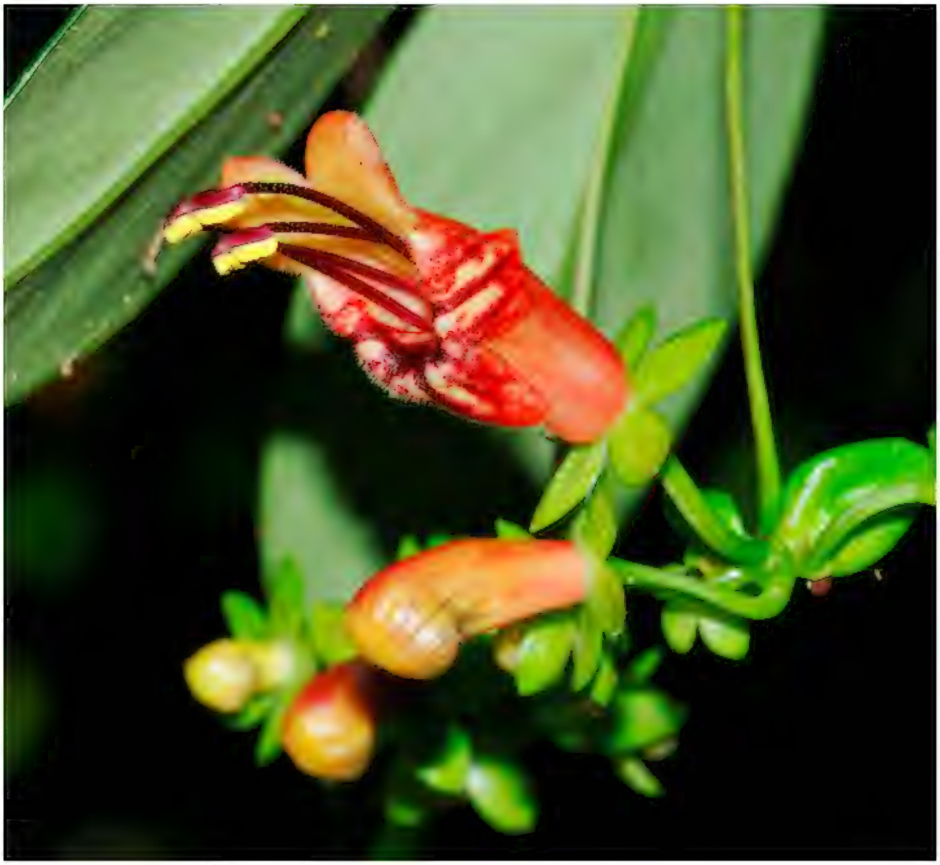
The Sue Ling Gin Garden is supported by the William G. McGowan Charitable Fund in Memory of Sue Ling Gin-McGowan.

Take a Break in the Sue Ling Gin Garden

Over the centuries, classical Chinese gardens have been carefully crafted as spaces for contemplation, relaxation, and appreciation of nature. Classical gardens are experienced as works of art, and were originally designed by artists who took inspiration from landscape paintings. The first classical gardens date to the 6th century.

Garden visits often include contemplative moments during which visitors can gaze at the *guaishi*, or spirit stones. These ancient limestone formations were sculpted into unique shapes over millions of years by erosion. The ones that you see here are from China's Lake Tai, the largest weighing two tons. (Catalog numbers 358196, 358198, and 358199).

Join us for Member Early Entry Hours to learn how to take beautiful photography in the Sue Ling Gin Garden and your other favorite locations in the Museum! Member Early Entry is from 8-9am on Saturdays through December 18. No advanced registration is required.



(Left) The flower Aeschynanthus *acuminatus in southern Vietnam. Even the floral shapes are consistent with other populations, the plants in this population attract a unique group of visitors, rodents, in addition to typical bird pollinators.*

(Below) Graduate student, Jing-Yi, extracting nectar from the flower of Aeschynanthus acuminatus *in* Yunnan, *China. Nectar is the sole reward provided for the visiting animals, its properties are a critical indicator for scientists to infer which groups of animals might pollinate it.*

JING-YILU (UNIVERSITY OF CHICAGO, COMMITTEE ON EVOLUTIONARY BIOLOGY)
YU-TIAN HUANG

In The Field Exclusive:

SCIENTISTS DISCOVER A RARE MIXED POLLINATOR SYSTEM IN ASIA

BY JING-YI LU, GRADUATE STUDENT (UNIVERSITY OF CHICAGO, COMMITTEE ON EVOLUTIONARY BIOLOGY), NEGAUNEE INTEGRATIVE RESEARCH CENTER

Here in the Midwest, when we think of pollinators, we tend to think of bees, butterflies, and hummingbirds. But in many parts of the world, other types of birds and a variety of mammals, from bats to mongooses, are important pollinators. My recent fieldwork in Southeast Asia added some new animals to the mix. I am interested in how plants with specialized pollination systems evolved within a varied mosaic of pollinating animals. The Southeast Asian plant genus *Aeschynanthus* (aka "the lipstick vines") is an ideal system of organisms for studying this phenomenon. Most of its 160 species exhibit typical floral features for bird pollination, with long reddish corolla tubes that secrete large amounts of nectar. The majority of species of this plant are thought to be solely pollinated by specialized nectar-feeding sunbirds, whose range largely overlaps that of these plants.

A conspicuous exception is *Aeschynanthus acuminatus*, a plant widespread across mainland East Asia, but which also occurs in Taiwan, beyond the range of sunbirds—which necessitated a shift in its pollination strategy. My earlier research in Taiwan revealed that this plant is exclusively pollinated by a group of generalist songbirds, including the grey-cheeked fulvetta, white-eared sibia, and Taiwan yuhina. This was facilitated by a key adaptation in the plant's floral shape: a wider and shorter corolla tube that allows for probing by these birds' thicker beaks. However, the pollinators of this plant in mainland Asia, where both sunbirds and generalist songbirds occur, were still unknown.

My colleagues and I conducted fieldwork in Vietnam, southwest China, and Taiwan from 2019 to 2021 and produced some breakthrough findings. In Yunnan, southwestern China, we documented the black-throated sunbird as likely the sole pollinating species for this plant. In southern Vietnam, however, we observed and photographed pollination by both a sunbird and a generalist songbird, and, to my surprise, my camera traps documented the first known case of nocturnal pollination by rodents in Southeast Asia, and only the second in Asia. The flowers' wider, shorter tubes enabled tiny mice to access the nectar without destroying the flowers. These findings mark the first reported mixed bird-rodent pollination system in Asia.

This variation in pollinator composition among distinct plant populations suggests that *Aeschynanthus acuminatus* developed a generalized pollination system that accommodated locally available pollinators, enabling it to thrive in wider geographic areas.

This research was supported by a generous grant from The Negaunee Foundation.

INSPIRED BY NATURE: BIOMIMICRY

BY KATIE ARNOLD, EXHIBITIONS

As the Fall season approaches, the cooler temperatures serve as a welcome invitation to reconnect with nature and take long hikes to catch the changing colors of the leaves. These outdoor excursions in more remote locations often result in the involuntary collection of burrs on our clothing—especially on pets! That is precisely what happened to George de Maestral, the inventor of Velcro.

In the 1940s, while hunting in the Jura Mountains of Switzerland, engineer and inventor George de Maestral noticed the burdock seeds that had attached to the fur of his dog, Milka. He wondered how these small burrs could attach themselves to both his dog and his clothing. Upon closer inspection, he noticed their hook design. Inspiration struck! What if he could use this idea to create something new? Over the next 15 years, he refined and patented his design for Velcro.

The popularity of this new fabric spread like wildfire. It quickly caught the attention of engineers at the National Aeronautics and Space Administration who were looking for a way to help astronauts secure their hand tools while in the zero-gravity environment of space. This new technology was the perfect solution—just a small, two-inch square of Velcro was enough to secure 175 pounds and keep important tools from floating away.

This is just one example of the many fascinating stories about how nature has inspired inventions throughout history. In *The Machine Inside: Biomechanics*, visitors can explore many examples of biomimicry, or the process of designing and producing materials based on living things. Biomimicry can be seen all across the world, woven into architecture, transportation, medicine, and sports. And, these new inventions continue to change the world as we know it.

In *Biomechanics*, visitors will be exposed to a multitude of biomimicry stories—from walking robots to echolocating canes—and challenged to look at the world differently, just as George de Maestral did in 1941. What other pieces of natural engineering are yet to be discovered? Where will we find inspiration next?

JEMBE

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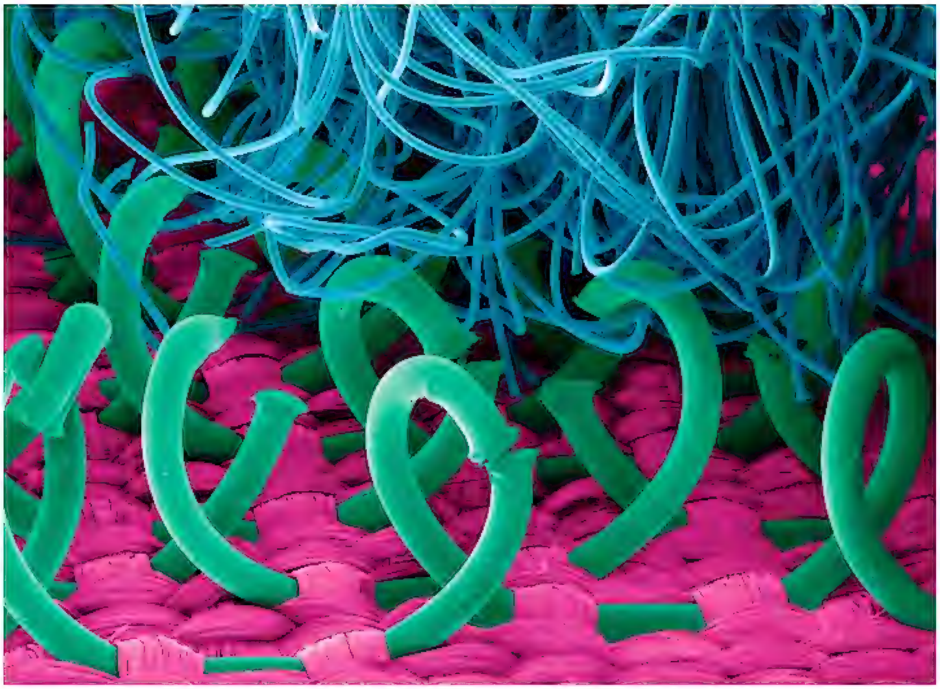
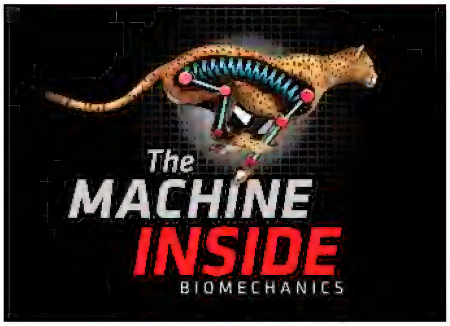


(Top) Burdock seeds like these inspired George de Maestral's invention of Velcro in 1941.

(Above) A close-up scan of velcro reveals its hook and loop design which mimics the natural structure of burrs.



The Machine Inside: Biomechanics is now open in the Fay and Daniel Levin Hall. Admission is free for members.

The Machine Inside: Biomechanics was developed by the Field Museum, Chicago.

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Research by the rapid inventory team suggests that Peru's Putumayo river basin boasts some of the oldest rainforests in the Amazon.

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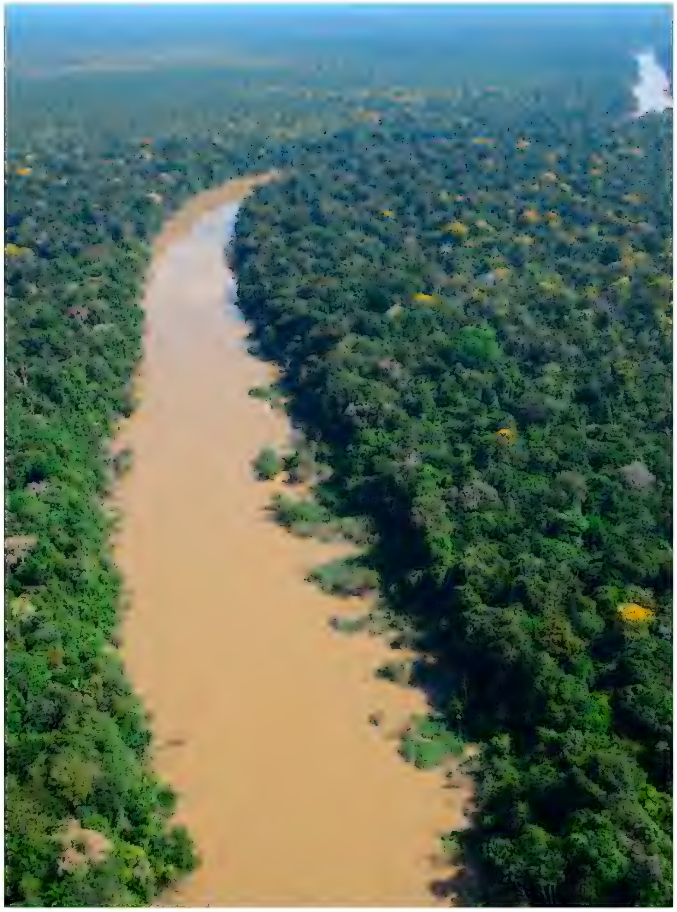
A FOREST

UNALTERED FOR 5,000 YEARS

By Nigel Pitman, PhD

MELLON SENIOR CONSERVATION ECOLOGIST, KELLER SCIENCE ACTION CENTER



ÁLVARO DEL CAMPO

ONE OFTEN HEARS THAT INDIGENOUS COMMUNITIES HAVE BEEN PRESERVING NATURAL LANDSCAPES FOR THOUSANDS OF YEARS. AND TO CONSERVATIONISTS LIKE THOSE IN THE MUSEUM'S KELLER SCIENCE ACTION CENTER, IT SOUNDS INTUITIVELY TRUE.

In the Amazon, though, more and more studies suggest that much of the forest was altered by people before the arrival of Europeans. Plenty of Amazonian forests that look like "wilderness" today show evidence of ancient forest-clearing, agriculture, plant domestication, and road-building.

What does this mean for the places where the Museum's rapid inventory team works? Those remote, pristine-seeming areas we visit—were they garden plots a few hundred years ago?

To answer that question, we collected soil samples on two recent inventories in Peru and sent them to colleagues who study soil charcoal (University of Amsterdam) and phytoliths, or fossilized plant tissue (Smithsonian Tropical Research Institute). Many plants take up silica from the soil and use it to produce microscopic mineral particles called phytoliths that provide structural support. After a plant dies, phytoliths linger in the soil for thousands of years. Different kinds of plants produce differently-shaped phytoliths, meaning that phytoliths in the soil can be used to reconstruct past vegetation. For example, phytoliths of crop species indicate that agriculture was present.

In addition, microscopic bits of charcoal in soil tell us how many people were around. Because of the ever-wet climate in the Western Amazon, there aren't natural forest fires from lightning strikes. If something burns, it's because a person set it on fire. And because soils get older as you dig deeper, carbon-dating those charcoal and phytolith records lets scientists peer several thousand years into the past and catch a glimpse of the landscape. By comparing those results to modern-day tree surveys at the same site, we can determine how similar or different those ancient landscapes were from what we see today.

Instead of showing large-scale ancient impacts, the rapid inventory soils tell a 5,000-year story of populated but relatively undisturbed forests. In other words, the sites we visited were *not* massively altered by people in pre-Columbian times. We can see that people were there from small amounts of charcoal in the soil—but we can also see that they didn't transform the landscape. For 5,000 years, the forest looked pretty similar to the way it looks today.

Remember the idea that "indigenous communities have been preserving natural landscapes for thousands of years"? Well, we're providing some scientific evidence to support it. We often say that the places we visit in rapid inventories are well-preserved because the people who live there know how to make a good life from the forest around them without impoverishing it. And here's some evidence that they've been doing it for thousands of years.

NIGEL PITMAN

(Above, left) Since 2001 the Field Museum has carried out 8 rapid inventories and helped create 7 new parks in the Putumayo watershed bordering Colombia and Peru.

(Above) Soil samples like these hold 5,000 years' worth of land use history in the form of pollen, phytoliths, and charcoal.

(Left) Fiske students and volunteers from Gateway to the Great Outdoors work together to install a bird friendly native plant garden in Washington Park in May of 2021.

COLLEEN MCVEIGH

Fiske Elementary	378 Students
98.1% Black	1.6% Hispanic
11% Diverse Learners	97% Low Income

STUDENTS EXPERIENCE BIODIVERSITY AT FISKE ELEMENTARY

BY COLLEEN MCVEIGH, URBAN CONSERVATION EDUCATOR, KELLER SCIENCE ACTION CENTER

In the midst of the pandemic, Fiske Elementary, in the West Woodlawn neighborhood of Chicago, became a partner school of the Field Museum's Youth Conservation Action program. Teachers and administrators at Fiske wanted to weave environmental education into daily instruction, to create a school community that embodies healthy habits and environmentally friendly behaviors. The Fiske Elementary community takes pride in their building, which stands on the edge of historic Washington Park, and wants to contribute to stewardship of this urban resource.

Inspired by bird watching in the park, students were determined to further improve biodiversity by reducing litter and lobbying the park administration for the opportunity to create a bird-friendly garden. Fiske science teacher Sean Murphy and I supported these student-developed action plans.

"This was an opportunity for students to focus on more hyper-local issues and see the way that larger concepts apply in that space. It also allowed students to engage with local stakeholders in a way that was different from previous projects," said Murphy.

Sixth grade students installed a pollinator garden near the bridge to Bynum Island. Assisted by volunteers from Gateway to the Great Outdoors and Keller Science Action Center Ecologist Iza Redlinski, the students also learned about host plants of caterpillars and other insects that make up the bulk of the birds' spring diets. Their small garden now boasts three kinds of milkweed as well as several plants that provide seeds and nectar.

Seventh grade students focused on the quantity of litter in Washington Park and its effect on wildlife, particularly birds. Students, guided by Murphy, learned about policies and practices that impact the amount of litter in the park, and interviewed park management. The students developed an anti-litter campaign as well as analyzed the litter and developed suggestions for the Park District.

"I would like to approach future units with a similar style of project that requires students to identify issues, use criteria based decision making and work collaboratively to solve a problem," said Murphy. "Students were more invested in this project, particularly remotely, and it was a reminder of the work students can do if given the time and resources."

THE XERCES BLUE BUTTERFLY EFFECT

BY FELIX GREWE, PHD, DIRECTOR, PHYLOGENOMIC STUDIES, GRAINGER BIOINFORMATICS CENTER

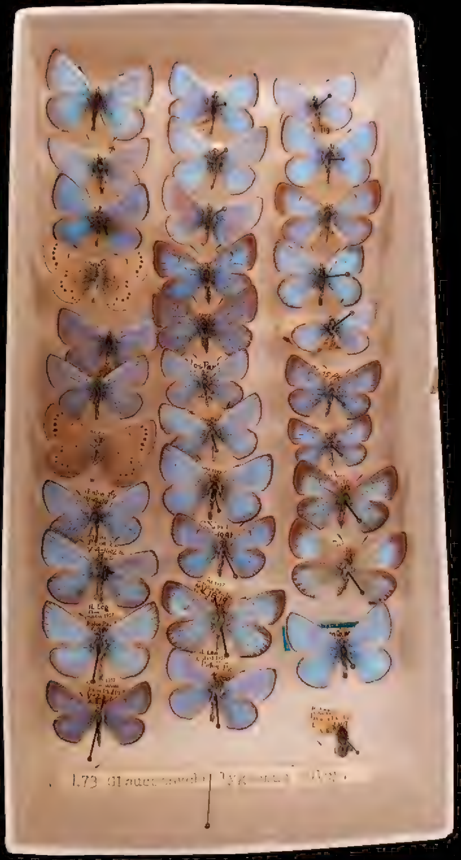
Undeniably humans have intervened with all life on Earth—for better and for worse. A hundred years ago, human development on the San Francisco Peninsula dramatically disturbed the soil of the sand dunes, causing a loss of many local plants. These plants were hosts for the caterpillars of the extremely range-specific Xerces blue butterfly (*Glaucopsyche xerces*). This loss of habitat eventually caused the extinction of this species in the early 1940s.

The Xerces blue was the first butterfly known to go extinct due to human impacts and became an iconic example for insect conservation. But some have always questioned whether Xerces blue was truly a distinct butterfly species, or simply an isolated population of another extant, currently-living species.

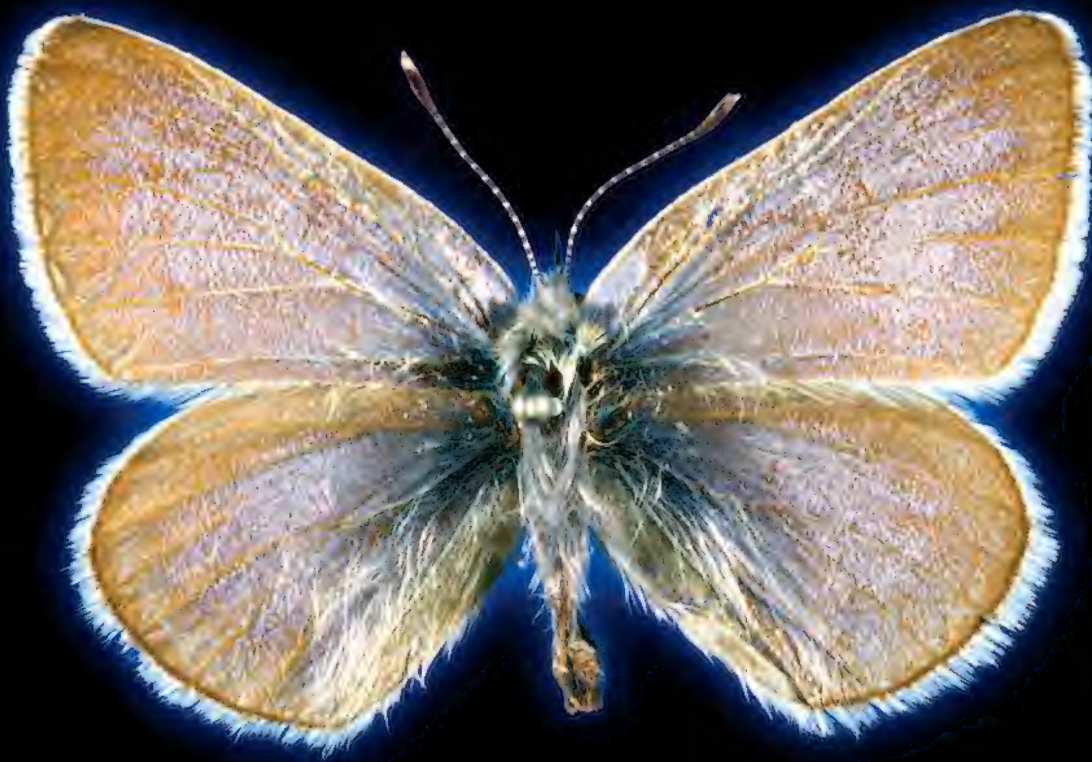
Almost 100 years after the last sighting of a living Xerces blue, we now have the technology to answer this long-standing question. We used technology available at the Field Museum's Pritzker Lab and the Grainger Bioinformatics Center to sequence and analyze the genome of a Xerces blue. The DNA for this approach was isolated from a 93-year-old specimen of the Field Museum collection.

Although the DNA was extremely fragmented due to its old age, we were able to meticulously piece together the complete mitochondrial genome. We compared it to the sequences of other living butterflies and showed that Xerces blue was indeed a distinct species. Unfortunately, Xerces blue is just one famous example and representative of many other human-induced species extinctions. And, every loss of a species likely has a massive ripple effect across ecosystems.

This study highlights the importance of museum collections. Our research would not have been possible without the collection of the Xerces blue specimen in the 1940s, when no one was thinking about sequencing DNA. That's why we must keep collecting, for researchers 100 years into the future. Although the wings of Xerces blue won't flutter anymore, we hope that studying the butterfly's history will inform us in our efforts to conserve other precious and irrecoverable species on Earth.



FELIX GREWE



JOHN WEINSTEIN

(Above) Museum specimens of the Silvery blue butterfly (Glaucopsyche lygdamus), a living relative of Xerces blue. The appearance of these butterflies and level of blue color can vary across individuals.

(Left) A close-up photo of an extinct Xerces blue butterfly (Glaucopsyche xerces) from the collection at the Field Museum.

Chicago State University Students (from L to R) Darcae Holmes, Korvell Russell, and Dr. Molly McDonough sampling frozen tissues stored in the Field Museum's cryostorage facility.

Unlocking the Vault:

FIELD MUSEUM'S TISSUE SAMPLES UNVEIL MYSTERIES OF CORONAVIRUS

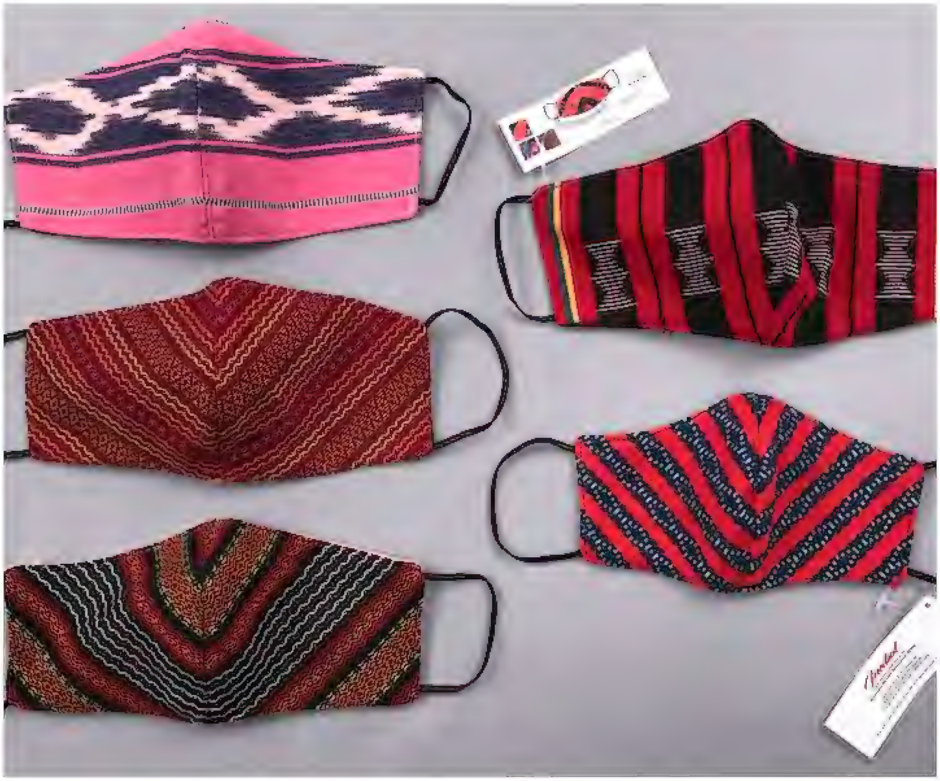
BY ADAM W. FERGUSON, PHD, NEGAUNEE COLLECTION MANGER, MAMMALS, GANTZ FAMILY COLLECTIONS CENTER

Middle East Respiratory Syndrome (MERS), Severe Acute Respiratory Syndrome (SARS), and Severe Acute Respiratory Syndrome-2 (SARS-CoV-2), all members of the Coronaviridae viral family, have one other thing in common: zoonotic origins. Zoonoses, or diseases originating in wildlife that can infect humans, account for 75% of all new emerging infectious disease outbreaks, and unfortunately this percentage is on the rise. To make matters worse, our knowledge of these pathogens, and in particular the diversity of natural hosts maintaining them, is not increasing proportionately to disease emergence. Together with colleagues both within and outside the Museum, we are working to help fill in some of this gap, with a particular focus on coronaviruses in bats.

Combining modern molecular techniques with the vast collection of flash-frozen tissue samples collected by Field Museum scientists over the last three decades, "Team CoV Hunter," as we like to call ourselves, is working to screen more than 1200 bat tissue samples for pathogens like coronaviruses. This intensive screening is being led by Field Museum Research Associate and Chicago State University (CSU) Assistant Professor Dr. Molly McDonough and a cohort of four CSU undergraduate students, with support from an Institute of International Education Centennial Fellowship. Through collaborations with disease modelers at Georgetown University and the University of Oklahoma, our screening efforts are tailored to test predictions of undetected bat species that have a high probability of being infected with betacoronaviruses.

Through this effort, we hope to detect unknown viruses and hosts for betacoronaviruses. Applying next-generation sequencing techniques to obtain whole genomes of these viruses, this research will elucidate the evolutionary history and host-viral relationships for the genus of viruses responsible for the current Covid-19 pandemic. We've worked hard to optimize the molecular methods for detecting these viruses, and although there's a bit more tweaking to be done, we are optimistic about our project's ability to unlock the secrets held within the vast collection of cryopreserved tissue samples Field scientists have and continue to collect and store.

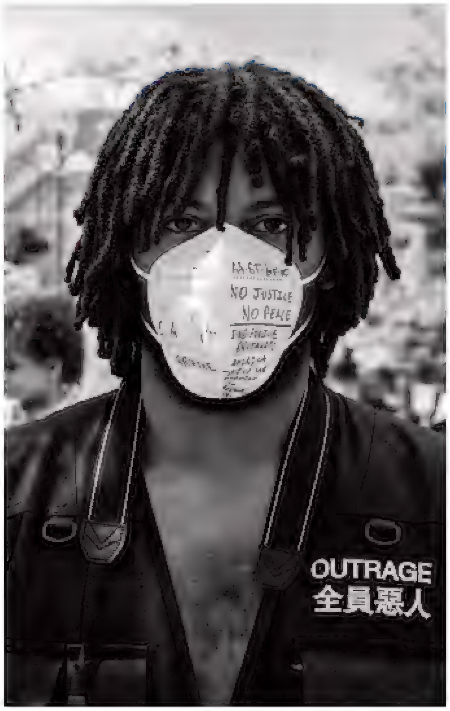
This project is part of the 2021 Science Innovation Award for "Of models and specimens: Testing predictions of betacoronavirus host with the Field Museum's mammal tissue collection." The Science Innovation Award is made possible by a generous endowment from an anonymous donor and is granted on a competitive basis each year by the Field Museum Science and Scholarship Funding Committee.



JAMIE KELLY

(Left) 5 of 56 masks in the collection, sent by Director of the Museo Kordilyera, Analyn "Ikin" Salvador-Amores to community partner Lani Chan. The collection represents wide regional diversity.

(Below) This photo was taken by Chris Brown (aka Thought Poet), a young Chicago artist who documented the protests of the summer of 2020 and the response to the pandemic. About 100 of his documentary photographs are in the collection.



CHRIS BROWN

A NEW FIELD MUSEUM COLLECTION

BY ALAKA WALI, PHD, CURATOR OF NORTH AMERICAN ANTHROPOLOGY, NEGAUNEE INTEGRATIVE RESEARCH CENTER; **JACOB CAMPBELL, PHD**, ENVIRONMENTAL SOCIAL SCIENTIST, KELLER SCIENCE ACTION CENTER; AND **CHRIS JARRETT, PHD**, ENVIRONMENTAL SOCIAL SCIENTIST, KELLER SCIENCE ACTION CENTER

As the COVID-19 pandemic affected all aspects of our lives in the spring of 2020, museums across the country began documenting its impact by collecting objects and narratives. When large-scale protests started in June in response to the police killing of George Floyd, cultural institutions developed efforts to bear witness to the national reckoning on racial and economic injustices, as well. The Field Museum quickly organized a small task force to respond to these historic developments. With staff from the Integrative Research Center, Gantz Family Collections Center, and the Keller Science Action Center, we started to build a new collection of artifacts and materials reflecting cultural responses to the COVID-19 pandemic, the economic devastation, and the simultaneous activism for social and racial justice.

The effort adds to existing collections of diverse cultural responses to disease, healing, and social change over time. These collections contain many items from different parts of the world that are used for protection, both physical and spiritual. Today, people around the world create similar objects to respond to the pandemic, including a wide range of digital materials. Our team focused primarily on working collaboratively with communities where we have existing relationships, such as:

- Chicago- and Calumet Region-based organizations, schools and individuals with whom the Museum conducts participatory research or programs. The Chicago Cultural Alliance is an important partner. We have also partnered with several faculty members at DePaul University.
- Native American and Filipino community members collaborating on curation and exhibitions.
- Communities in Peru and Colombia with which the Museum has research and conservation action programs.

To date, we have assembled more than 100 objects, such as a diverse array of hand-crafted masks, "essential worker" thank you banners, and articles of clothing. The "digital artifacts" we have collected include artwork, educational materials, and viral memes that reflect peoples' creativity in the use of new media to convey messages or share resources. Many of the artists who have contributed pieces are also active in efforts to ameliorate the economic and social impact of the pandemic. To contextualize the collection, the team is using photography and conducting ethnographic interviews with our community collaborators. Drawing upon discussions with our task force, the Learning Center has collaborated with public school teachers to integrate a COVID Collections unit into curriculum, which exemplifies how the collection can function as an educational resource. We are currently developing a website to showcase the collection and our research results.

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The Field Museum is grateful to all members of the Field Loyalty Club. Their 20-plus years of dedicated philanthropy have allowed the Museum to be a global leader in science. This list reflects members and donors who achieved 20 years of giving in 2020.

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Field Loyalty Club Spotlight:

Karla Scherer

My interest in and support of the Field Museum began when I lived in Grosse Pointe, Michigan. The Museum was high on the list of preferred destinations for my three young daughters, and is now for their children. It was a much different place 40 years ago, but no less stimulating for young minds as they dreamed of the future. One of those young girls, my daughter, is now a professor of cultural anthropology whose area of expertise is the Karen tribes of Burma/ Myanmar and Southeast Asia.

Due to the Covid-19 pandemic, I have not physically visited the Field in almost two years, but some of my best memories are of spending planned, in-depth time in the *Griffin Halls of Evolving Planet*. I also fondly recall the opening of the *Image of the Afterlife* exhibition in 2013 where a French specialist, using scientific data, had created a likeness of a specific woman from her excavated skeleton.

In 2008, I visited the South Pacific by small ship with the Field. It was the antithesis of what a typical tourist would see and do; among other things, we saw stingless jellyfish in Palau, World War II partially submerged matériel, and interacted with seldom-visited inhabitants of the Solomon Islands.

I continue to support the Field because it is a place to learn and to wonder—to wonder about the past, as well as, by extrapolation, the future.

“MYSTERY PLANT” FROM THE AMAZON DECLARED A NEW SPECIES

BY KATE GOLEMBIEWSKI, PUBLIC RELATIONS

AIn 1973, Field Museum Curator Emeritus Robin Foster, PhD, stumbled on a strange tree in the Amazon rainforest, unlike anything he’d ever seen. It was about 20 feet tall, with tiny orange fruit shaped like paper lanterns. He collected samples of the plant’s leaves and fruit, but all the scientists he showed them to wound up scratching their heads—not only were they unable to identify the plant as a species that had previously been described, but they couldn’t even declare it a new species, because they couldn’t tell what family it belonged to. But, in a new study in the journal *Taxon*, scientists analyzed the plant’s DNA and determined where it belongs in the family tree of trees, finally giving it a name meaning “Mystery of Manu,” after the park in Peru it came from.

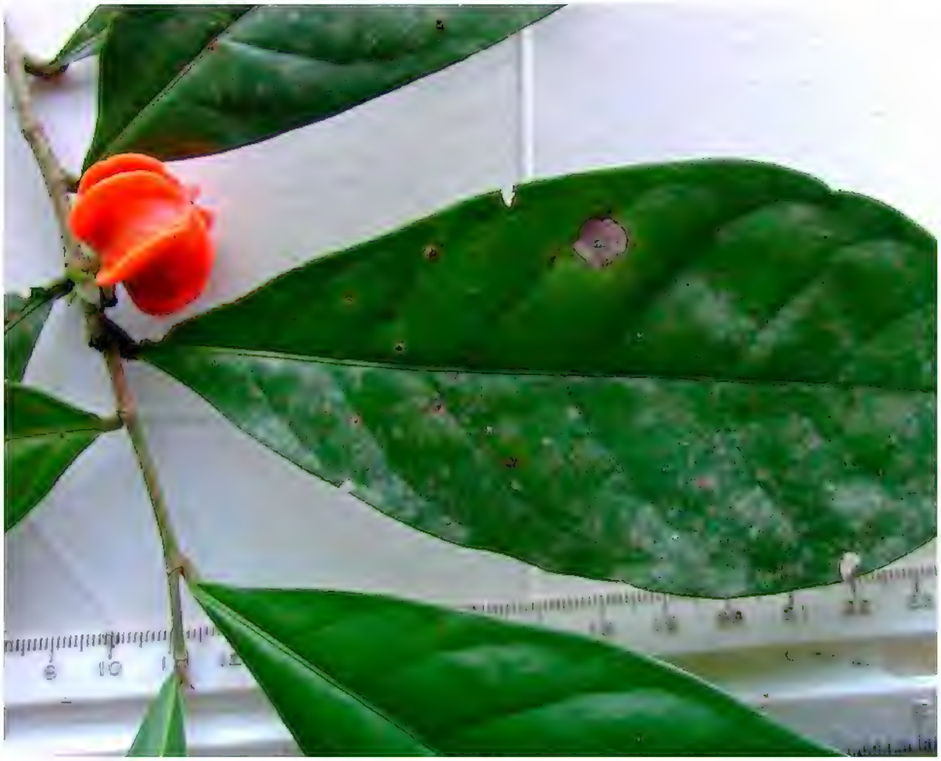
“When I first saw this little tree, it was the fruit—looking like an orange-colored Chinese lantern and juicy when ripe with several seeds—that caught my attention,” said Foster. “I didn’t really think it was special, except for the fact that it had characteristics of plants from several different plant families, and didn’t fall neatly into any one. Usually I can tell the family by a quick glance, but damned if I could place this one.”

The mystery plant sat in the Field Museum’s herbarium, a library of dried plant specimens, for years, but Hensold and her colleagues didn’t forget about it. The team eventually received a grant from the Field Museum’s Women’s Board to study the plant and the search was on.

“When my colleague Rick Ree sequenced it’s DNA and told me what family it belonged to, I told him the sample must have been contaminated. I was like, no way, I just couldn’t believe it,” recalls Hensold.

The DNA analysis revealed that the mystery plant’s closest relatives were in the Picramniaceae family, which was a big deal to the botanists because it didn’t look anything like its closest relatives, at least at first glance. “Looking closer at the structure of the tiny little flowers I realized, oh, it really has some similarities but given its overall characters, nobody would have put it in that family,” says Hensold.

With the DNA finally revealing what family the plant belonged to, the researchers were able to give it a formal scientific name, *Aenigmanu alvareziae*. The genus name, *Aenigmanu*, means “mystery of Manu,” while the species name is in honor of Patricia Álvarez-Loayza, who collected the first fresh specimens used for the genetic analysis.



(Top) Nancy Hensold, Patricia Álvarez-Loayza, and Robin Foster examine the field’s specimen of Aenigmanu alvareziae.

(Above) A live specimen of Aenigmanu alvareziae *used to sequence the species DNA.*

Teens in the Digital Lab work with Karl Bitikofer (DIRECTION), Teen STEM Learning Experiences Coordinator, on their various projects.

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CONNECTING TEENS TO CAREERS IN STEM

BY LAUREN WAGNER, EDUCATION

This summer, 13 high school students from all around Chicagoland participated in the first ever Digital Learning Program at the Field Museum. This unique program offered teens the opportunity to participate in research with some of the newest technological tools available to science. In addition to 5 weeks of research experience, the teens honed their skills in digital media creation, science communications, and computational thinking through creative projects and regular training.

To incorporate a large variety of technology with scientific practices, the teens were paired with scientists from the Negaunee Integrative Research Center to bring their projects in botany, ichthyology, paleontology, and anthropology to life.

> **"I've always wanted to be an engineer but my school doesn't offer those kinds of classes so this is the first time I'm able to be a part of any engineering classes."**
>
> **— Mario, 16**

Teens working in Botany focused on community science. Mentored by Research Assistant Heaven Wade and Collections Manager Matt von Konrat, PhD, they learned how to build a Zooniverse website for mosses and liverwort identification. Zooniverse is a community science website that empowers people from all over the world to participate in real research. In ichthyology, teens paired with NSF Postdoctoral Fellow Andrew George measured fish specimens from the Amazon and combined their data with lifestyle data made available from FishBase, a global database of fish species.

Teens also worked on several scanning and 3D modeling projects. Working with Paleobiology PhD Student Caroline Abbot, 3D scans of 200-million-year-old skulls were made and then 3D printed at life size. Caroline's work helped the teens learn about the anatomy of animals so they could accurately reconstruct muscles and soft tissue out of modeling clay. Conservator in anthropology JP Brown showed his teens how to turn photographs of cylinder seals into 3D models.

The Digital Learning Program gives teens a catalyst to jump start their curiosity, linking them to new passions, guiding them on different STEM career paths they could pursue, and providing resources to support them as they contemplate careers in STEM.

Do you know a teen who would love to participate in the Digital Learning Program? Registration for the Summer 2022 program will begin in January 2022. Stay tuned for more information!

Member Opportunities

EARLY ENTRY FOR MEMBERS AND DONORS

Saturdays through December 18, 8–9am

Members can enjoy exclusive early entry on Saturdays. Stroll through your favorite exhibitions and enjoy quiet moments in our smaller galleries before the Museum opens. This is also the perfect time to visit our newest exhibitions, *The Machine Inside: Biomechanics* and *Wild Color*. Plus, beginning in November, join us for an exclusive morning chat to celebrate 100 years on our lakefront home which will highlight the history and architecture of our building.

VIRTUAL MEMBER PROGRAMS

Every month members have the opportunity to learn more about the work happening at the Museum and around the world directly from Field staff and scholars. Details about these events are shared through our weekly member e-newsletter. Make sure your email address is up-to-date with us so you don't miss out on any of these events! Please contact the Membership Department at membership@fieldmuseum.org to add or update your email address.

HOLIDAY LOUNGE

During the week of December 26, 2021 through January 2, 2022, the Founder's Room will be open to donors and members. Stop in for a light refreshment, table activities for the family, or just to take a break and reflect on your visit.

Members-Only *Frozen* Experience

Date: Friday, December 17, 2021, 6:45 pm

Location: Cadillac Palace Theatre

Tickets: $195

Join us for an evening of winter enchantment as the Field Museum's Learning Center team shares how animals survive in some of the coldest temperatures, then sit back and enjoy the magic that is ***Frozen!***

From the producer of *The Lion King* and *Aladdin*, ***Frozen***, the Tony®-nominated Best Musical, is now on tour across North America, and the critics rave, "It's simply magical!" (*LA Daily News*). Frozen features the songs you love from the original Oscar®-winning film, plus an expanded score with a dozen new numbers.

An unforgettable theatrical experience filled with sensational special effects, stunning sets and costumes, and powerhouse performances, ***Frozen*** is everything you want in a musical. It's moving. It's spectacular. And above all, it's pure Broadway joy.

For more information please email us at membership@fieldmuseum.org or call us at 312.665.7700.

Audience members are required to be masked and show proof of vaccination. For those with exemptions, proof of a negative COVID 19 test is required. Visit broadwayinchicago.com/covid19 for further details.

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Based in Chicagoland since 1968, we are a proud supporter of the Field Museum and its efforts to promote a greater understanding and appreciation of the world in which we live.

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Extended Holiday Hours and Early Closures

As the holiday season approaches, the Field Museum will be hosting extended hours for visitors to enjoy the Museum even longer!

On these days the Field Museum will be open until 6pm:

Friday November, 26 and Saturday, November 27

December 26 through December 30

The Field Museum will be closed on Thanksgiving Day, November 25 and on Christmas Day, December 25. There will be early closure at 3pm on December 9 and on Christmas Eve, December 24.

For the most up to date information, parking, and public transportation options, visit fieldmuseum.org/visit.

The Field Museum salutes the people of Chicago for their long-standing support of the Museum through the Chicago Park District.

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As a current Field Museum member, you have created wonderful memories to look back on, all while enjoying the benefits of your membership. Bring endless joy to your loved ones this holiday season with a Field Museum membership.

- **Free Basic admission, along with free or discounted tickets to special exhibitions**
- **Invitation to our Annual Member's Nights and many more virtual programs exclusively for members**
- **Discounts on educational programs and in the Museum's stores and restaurants**
- **And so much more!**

Purchase a gift membership early to ensure arrival before the holidays! Gift recipients have 90 days from the purchase date to activate their membership. To learn more about our gift memberships, email membership@fieldmuseum.org or call us at 312.665.7700.